cyclopean monstrosities, in salmon and trout. The author tells us that the bony fishes are specially important for the study of teratological variation; oviparity and the abundance of eggs ensure plentiful material at all stages for observation and experiment, and although the major types rarely live after the yolk has been absorbed, at this time nearly all the organs, except the bony skeleton, have attained their adult form and relations.

Double monsters, and especially those that are double at the anterior end, are so numerous and variable that they require detailed classification, and in his arrangement Dr. Gemmill differs from his predecessors by taking into consideration the internal structure.

In addition to the chapters on the major abnormalities, which form a valuable original contribution to vertebrate teratology, there is one on minor abnormalities, which aims at facilitating the task of the future worker by introducing him to the literature of the subject, and should be very useful for this purpose. C. T. R.

Über die krankhaften Erbanlagen des Mannes. By F. Lenz. Pp. iv + 170. (Jena: G. Fischer, 1912.) Price 4.50 marks.

THIS is an interesting discussion of the inheritance of hæmophilia and other sex-limited conditions in man and animals, and their bearing on the determination of sex. In the case of hæmophilia the author believes that an affected man never transmits the disease, even through his daughters to his grandsons, and supposes that this is due to non-viability of spermatozoa bearing the factor for the affection. This conclusion is difficult to accept when hæmophilia pedigrees are compared with those of other sex-limited affections. He also concludes that the apparent abnormalities of the sex-ratio in affected families, and the excess of affected members over unaffected, are likewise due to incompleteness in the records. In his examination of sex-limited inheritance in general the author has read widely, but sometimes misunderstands those whose writings he discusses. His hypothesis of the mode of inheritance and of sex-determination seems to differ more in form than in substance from previously suggested factorial schemes. The work as a whole is one more illustration of the fact that for the solution of the problem further investigation is needed rather than discussion of what is already known.

New "Contour" Wall Map of the Mediterranean Lands. 40 × 76 inches. Scale 1 : 4,067,712, or 64·2 miles to one inch. (London: G. W. Bacon and Co., Ltd.) Price 16*s*.

THIS is an effective wall map which will be useful for class purposes. Two editions—with and without land names—are available. The map includes all the countries which at any time formed part of the Roman Empire, and both ancient and modern names are given, when these are shown. It is somewhat a disadvantage that the scheme of colouring to show land relief is not that usually adopted, and the blue stippling used to indicate areas with less than ten inches of rainfall can be seen only by a person standing near the map.

The map is constructed on a secant conical projection, and it may be obtained on cloth, with rollers, and varnished; or on cloth cut to fold.

Leather Chemists' Pocket-Book. A Short Compendium of Analytical Methods. Edited by Prof H. R. Procter, assisted by Edmund Stiasny and Harold Brumwell. Pp. xiv + 223. (London: E. and F. N. Spon, Ltd., 1912.) Price 5*s*. net.

THIS handy little volume is intended as an adjunct to the "Leather Industries Laboratory Book," by Prof. Procter, which was published in 1908. The pocket-book is based upon the manuscript laboratory sheets, giving the course of analysis essential to the practical student, in use in the authors' laboratory in the University of Leeds. The book should be particularly useful to students in evening classes studying the science and technology of the leather trades.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

X-rays and Crystals.

IN his discussion of Dr. Laue's diagrams Dr. Tutton (NATURE, November 14, p. 309) invites me to consider their physical aspects in the light of the crystallographical details which he supplies.

The rule which I gave in a previous letter to NATURE (October 24, p. 219), and which Dr. Tutton has in mind, is independent of all but the simplest facts of crystallography. It gives a numerical method of finding the positions of the spots on the diagrams, and its effect is merely to show that the positions of the spots give no information concerning the wave-length of the incident radiation.

In a paper read recently before the Cambridge Philosophical Society my son has given a theory which makes it possible to calculate the positions of the spots for all dispositions of crystal and photographic plate. It accounts also for the form of the spots and other details, and amongst other things it explains my numerical rule. It is based on the idea that any plane within the crystal which is "rich" in atoms can be looked on as a reflecting plane; the positions of the spots can then be calculated by the reflection laws in the ordinary way. In this extended treatment the facts of crystallography are of importance, but it would take too long to discuss the matter in a letter.

I should like to refer to one other point. Dr. Tutton suggests that the new experiment may possibly distinguish between the wave and the corpuscular theories of the X-rays. This is no doubt true in one sense. If the experiment helps to prove X-rays and light to be of the same nature, then such a theory as that of the "neutral pair" is quite inadequate to bear the burden of explaining the facts of all radiation. On the other hand, the properties of X-rays point clearly to a quasi-corpuscular theory, and certain properties of light can be similarly interpreted. The problem

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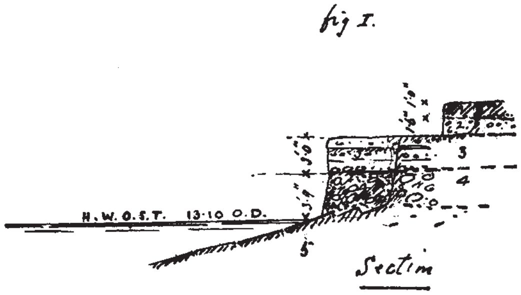
then becomes, it seems to me, not to decide between two theories of X-rays, but to find, as I have said elsewhere, one theory which possesses the capacities of both.

W. H. Bragg.

Worked Flints obtained from "the 25-foot Raised Beach" near Holywood, co. Down.

The 25-foot raised beach is well marked all round the northern and eastern coast of Ireland, and is also recognisable on the opposite coast of England and in the Isle of Man. This post-Tertiary beach is contemporaneous with the Upper Estuarine Clays of the Belfast sections,[1] and is certainly not later than early Neolithic. At different times worked flints have been obtained from this beach, notably from Larne, co. Antrim, and have been discussed, but no clue to their date or dates has been found. I have lately had the opportunity of carefully examining the section (Fig. 1 and 2) near Holywood, co. Down. From a 350-ft. exposure 683 worked flints were obtained.



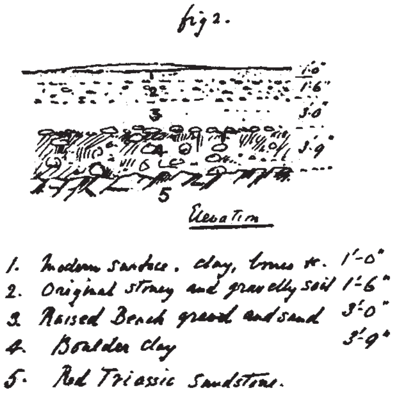


fig 2.
1·0"
1·6"
3·0"
3·9"
2
3
4
5
Elevation
1. Modern surface. clay, bones &c. 1'-0"
2. Original stoney and gravelly soil 1'-6"
3. Raised Beach gravel and sand 3'-0"
4. Boulder clay 3'-9"
5. Red Triassic Sandstone.

Description.		Per cent.	Notes.
Scrapers	Concave 70 Convex 17 Straight 76 ...	29·6	Chipped on non-bulbous face only. 4 Le Moustier type.
Knives	"Parrot-beaked" 39 Straight 80	21·6	All with tang. Worked on non-bulbous face only. 20 per cent. with shoulder (Les Eyzies).
Simple flakes	110	20·0	85 per cent. showing central ridge.

Punches, adzes, chisels, celts, cores, borers, microliths, about 4 per cent. each class.

No polished specimen was obtained, and all were of Palæolithic form, generally chipped on one face only. From the surface of the Boulder Clay specimens were obtained which had been subject to rolling before settlement of the land took place. Eight specimens showed re-chipping. Three prickers made from the ulna of deer were found. I submit that, considering the evidence of late Palæolithic work in Scotland in a similar horizon, the geological evidence, and the form and working of the flints found in this beach, they should be described as Mesolithic.

Henry Home.

Bellevue, Holywood, co. Down.

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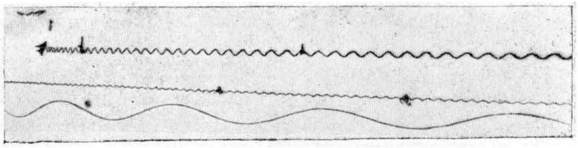
[1] Praeger, Proc. Roy. Irish Acad., vol. iv., 1897.

Note on the Upper Partials of a Tuning-fork.

It is well known that a smoked dropping plate can be used to find the pitch of a fork if the value of g is known, and the method is described in most of the text-books on sound. But so far as the writer is aware no attention has been directed to the fact that the existence of some of the upper partials can also be demonstrated with it and their frequency obtained. The method is simpler and more convincing to a student than the method of using resonators.



As an example the traces of the fundamental and the first two upper partials are shown in the diagram, which is a copy of the photograph of the traces on the dropping plate. The fundamental frequency of the fork used was 29·5, and the frequency of the first two upper partials should be (see Barton, "Text-book of Sound," §211) 185 and 518, while the numbers obtained from a single observation were 184 and 512 respectively. No attempt was made to obtain other partials, but doubtless the next two could have been obtained.

F. H. Parker.

Woolwich Polytechnic, November 9.

The March of Science.

In a school text-book, published in 1846 at Philadelphia, from which I was instructed in 1848—it was a geography, but contained five lessons in astronomy—is the following information about the sun:—

"In former times, it was supposed that the sun was a great ball of fire. Many learned men, however, are of opinion that it is a world like our own, containing continents, oceans, mountains, and plains.

"It is supposed that the rays of light which illumine the Solar System, proceed from an atmosphere, or air, of a peculiar nature, that surrounds the sun. The rays of the sun are called solar rays.

"When mingled with the atmosphere on the surface of the globe, it is thought that these rays produce the warmth and animation which render the earth habitable.

"This appears probable, from the fact that the summits of high mountains are always covered with ice and snow, while at their base, and in the valleys, the heat is oppressive. If heat proceeded from the sun, as from a body of fire, the higher we ascend from the surface of the earth, the greater the heat would become."

As I was only seven years old at the time I studied the book, the information did me no harm.

E. S.

Brookline, Mass., U.S., November 9.

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